

REMARKS

Claims 1-23 are presently pending in this application. Claims 1 and 7 have been amended to clarify certain aspects of these claims to expedite prosecution of this application, and without prejudice to pursuing these claims in unamended or other forms in a continuation or other application. New claim 23 has been added. In the December 4, 2006 Office Action, all of the pending claims were rejected. More specifically, the status of the application in light of the Office Action is as follows:

(A) Claims 1-3, 5-11, 13-19, 21, and 22 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,550,853 issued to Ostler ("Ostler"); and

(B) Claims 4, 12, and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ostler in view of U.S. Patent No. 5,901,167 issued to Sukhman et al. ("Sukhman").

A. Response to Section 102 Rejection of Claims 1-3, 5-10, 12-18, and 20-22 (Ostler)

Claims 1-3, 5-11, 13-19, 21, and 22 were rejected under 35 U.S.C. § 102(b) as being anticipated by Ostler. As set forth in detail below, Ostler cannot support a Section 102 rejection of claims 1-3, 5-10, 12-18 and 20-22 for at least the reason that this reference fails to disclose or suggest all the claimed features.

1. Independent Claim 1 is Directed to a Laser Including, *Inter Alia*, a Laser Source and a Power Source Arranged in an End-to-End Series Relation Along a Longitudinal Axis, and a Fan for Generating Air Flow Generally Parallel with the Longitudinal Axis

Independent claim 1 is directed to a laser comprising a laser source, a power source for causing the laser source to generate a laser beam, and a fan for generating an air flow. The laser source and the power source each have an exterior surface. The laser source and the power source are arranged in an end-to-end series relation along a longitudinal axis such that the fan directs the airflow generally parallel with the longitudinal axis to pass first substantially adjacent to the exterior surface of the laser source for cooling the laser source, and then to pass substantially adjacent to the

exterior surface of the power source for cooling the power source. Several embodiments of lasers in accordance with claim 1 accordingly have a power source at one end of the laser source such that the power source and laser source are inline with each other along the longitudinal axis.

2. Ostler Discloses a Laser System with an Integral Laser Head and Power Supply System

Ostler discloses a laser system with an integral laser head and power supply system. Referring to Figure 1, Ostler discloses a laser 10 including a housing 16 having a front portion 18 from which a laser beam 12 is emitted and a rear portion opposite the front portion 18. Referring next to Figures 2 and 4, the laser 10 includes a laser head 42 having an anode end 46 and a cathode end 48. The laser head 42 is at least partially housed in a plasma tube 50 having an exterior shell 52. The laser head 42 produces the laser beam 12 that passes through an output port 14 (Figure 1) at the front portion 18 of the housing 16.

Ostler also discloses a power supply heat sink 62 encircling the anode end 46 of the laser head 42. The power supply heat sink 62 is associated with a power supply that is "not shown." (Ostler, col. 4, lns. 55-56.) The power supply heat sink 62 provides heat dissipation for the power supply. Ostler further discloses a laser head heat sink 72 positioned circumferentially around the anode end 46 of the plasma tube 50 between the power supply heat sink 62 and the plasma tube 50. The power supply heat sink 62 surrounds the laser head heat sink 72 such that they are separated by a small air gap 74. Given the disclosed configuration, the likely location for the "not shown" power supply in Ostler is offset to one side of the longitudinal axis of the laser head 42 such that it contacts an outer portion of the power supply heat sink 62.

3. Claim 1 is Patentable over Ostler for at Least the Reason that this Reference Fails to Disclose or Suggest Several Claimed Features

Claim 1 is patentable over Ostler under Section 102 because this reference fails to disclose or suggest several claimed features. For example, the laser of claim 1 includes a laser source and a power source arranged in an "end-to-end series relation along a longitudinal axis." In contrast to the claimed arrangement, the applicants

respectfully submit that the power supply in Ostler's laser 10 is offset from the longitudinal axis of the laser head 42. As mentioned above, the power supply in Ostler is expressly "not shown." Based upon Ostler's disclosure and the specific arrangement of features in Ostler's system, however, the power supply would not be in an "end-to-end series relation along a longitudinal axis" with the laser head 42.

As shown in Figure 2 of Ostler, for example, the power supply heat sink 62 (a) surrounds the anode 60 and the laser head heat sink 72, and (b) is located proximate to the front portion 18 of the laser and the output port 14 through which the laser beam 12 is emitted. As a result, the power supply would need to be offset from the longitudinal axis of the laser head 42 so as to not interfere with the anode 60, the laser head heat sink 72, and/or the output port 14. Furthermore, Ostler's power supply is likely located so that it contacts the power supply heat sink 62 such that the power supply would be substantially offset from both the longitudinal axis and the end of the laser head 42. In fact, Ostler discloses that "the power supply and laser head must be designed to compliment each other such that the laser head can be mounted integrally within the power supply." (Ostler, col. 3, Ins. 64-67.) Such an arrangement is in direct contrast to the claimed "end-to-end series relation" of the laser source and power source of claim 1. Because Ostler fails to disclose or suggest all the claimed features, the Section 102 rejection of claim 1 should be withdrawn.

The Section 102 rejection of claim 1 should be withdrawn for at least one additional reason. Claim 1 requires that the fan blows the air flow generally parallel with the longitudinal axis to pass (a) first substantially adjacent to the exterior surface of the laser source for cooling thereof, and then (b) to pass substantially adjacent to the exterior surface of the power source for subsequent cooling thereof. In direct contrast to the claimed arrangement, Figure 4 of Ostler discloses that the air flow path through the laser first passes through the fins of the laser head heat sink 72 proximate to the front portion 18 of the housing 16, and then subsequently passes over the length of plasma tube 50 toward the cathode end 48 of the laser head 42 and through the exhaust air port 94. Assuming for the sake of argument that the "not shown" power supply is near the anode end 46 and in contact with the power supply heat sink 62, the air flow in Ostler's system accordingly passes adjacent to the power supply either before or in

parallel with passing adjacent to the anode end 46 of the laser head 42. The air flow than continues passing adjacent to the rest of the plasma tube 50 toward the cathode end 48. Accordingly, the air flow in Ostler's system is generally opposite to the air flow in the laser of claim 1. For at least this additional reason, the Section 102 rejection of claim 1 should be withdrawn.

Claim 1 is further patentable over Ostler under Section 103 because a person skilled in the art would not be motivated to modify Ostler to come up with the claimed combination of features. The applicant respectfully submits that it would require a significant reconfiguration of Ostler's device to position a power source in "end-to-end series relation along a longitudinal axis" with the laser source. More specifically, if the power supply was positioned within the power supply heat sink 62 to be in an end-to-end series relation with the laser source along a longitudinal axis, then it follows that the anode 60 required to excite the laser and the output port 14 required to direct the laser beam 12 would need to be repositioned. The Examiner has not provided how such a modification could be achieved or that such a modification would provide any benefit to Ostler's laser. The applicant accordingly suggests that such a modification to Ostler would require a significant redesign of Ostler's device for no apparent reason. Furthermore, such a reconfiguration is inapposite to the specific teachings of Ostler that disclose a laser head mounted integrally within the power supply. Accordingly, claim 1 is further patentable over Ostler under Section 103.

Claims 2, 3, 5 and 6 are patentable under Sections 102 and 103 over Ostler as depending from patentable base claim 1, and also because of the additional features of these dependent claims.

4. Independent Claim 7 is Directed to a Laser Including, *Inter Alia*, a Laser Source and a Power Source Aligned Along a Longitudinal Axis and a Cooling Fan Located in a Generally Straight Line Path with the Laser Source and Power Source

Independent claim 7 is directed to a laser having a laser source with a first end, a second end spaced apart from the first end along a longitudinal axis, a laser resonator, a laser media, and electrodes for exciting the laser media. The laser further includes a power source substantially adjacent to one of the first or second ends of the laser

source such that the power source and the laser source are aligned along the longitudinal axis. The power source is adapted for causing the laser source to generate a laser beam from the other one of the first or second ends. The laser of claim 7 further includes a cooling fan positioned substantially adjacent to the power source and located in a generally straight line path with the laser source and the power source along the longitudinal axis.

5. Claim 7 is Patentable over Ostler for at Least the Reason that this Reference Fails to Disclose or Suggest a Cooling Fan Positioned Adjacent to the Power Source and Located in a Generally Straight Line Path with the Laser Source and the Power Source Along the Longitudinal Axis

Claim 7 is patentable over Ostler under Section 102 because Ostler fails to disclose or suggest a cooling fan positioned adjacent to the power source and located in a generally straight line path with the laser source and the power source along the longitudinal axis. In contrast to the claimed arrangement, the fan 100 disclosed in Ostler is not only offset from the longitudinal axis, but it is also spaced apart from the longitudinal axis near the middle of the laser head 42. Nowhere does Ostler disclose or suggest that the fan 100, laser head 42, and power supply can be arranged in a straight line path along the longitudinal axis. Furthermore, as discussed previously, Ostler fails to disclose or suggest a power source that is substantially adjacent to one of the first or second ends of the laser source such that the power source and the laser source are aligned along the longitudinal axis. Because Ostler fails to disclose or suggest all the claimed features, the Section 102 rejection of claim 7 should be withdrawn.

Claim 7 is further patentable over Ostler under Section 103 because a person skilled in the art would not be motivated to modify Ostler to come up with the claimed combination of features. As discussed above with respect to claim 1, it would require a significant reconfiguration of Ostler's device to come up with the claimed arrangement of features, and such a modification is not suitable in light of the specific teachings of Ostler. Accordingly, claim 7 is further patentable over Ostler under Section 103.

Claims 8-11, 13, and 14 are patentable under Sections 102 and 103 over Ostler as depending from patentable base claim 7, and also because of the additional features of these dependent claims.

6. Independent Claim 15 is Directed to a Laser Including, *Inter Alia*, a Laser Source, a Power Source Substantially Adjacent to the Laser Source, and a Cooling Fan at One End of the Power Source

Independent claim 15 is directed to a laser comprising a laser source and a power source substantially adjacent to the laser source. The power source is adapted for causing the laser source to generate a laser beam. The laser also includes a cooling fan at one end of the power source. The cooling fan is adapted for generating an airflow directed in a generally straight line path with the laser source and the power source for cooling the laser and power sources.

7. Claim 15 is Patentable over Ostler for at least the Reason that this Reference Fails to Disclose or Suggest a Cooling Fan at One end of the Power Source

Claim 15 is patentable over Ostler under Section 102 because this reference fails to disclose or suggest a cooling fan at one end of the power source that generates an airflow directed in a generally straight line path with the laser source and the power source. In contrast with the laser of claim 15, Ostler's fan 100 is mounted to the housing 16 at a location proximate to the middle of the plasma tube 50. Referring to Figure 4 of Ostler, the cooling fan 100 appears to be spaced apart from Ostler's power source by a significant distance. In operation, the cooling fan 100 draws air into a space between the housing 16 and the plasma tube 50 such that the airflow makes a 90° turn to the left as it enters the housing 16 to flow around the outside of the plasma tube 50. The airflow then makes a 180° turn to flow across the left-most portion of the laser head heat sink 72 around the anode 60 and the power supply heat sink 62. The airflow continues through the plasma tube 50 across additional laser heat sinks 72 in a middle portion of the plasma tube 50 and out through a rear grill 80. The airflow in Ostler accordingly flows from the fan 100 along a tortuous path that initially turns 90° from the fan to flow along one portion of the plasma tube 50 and then turns 180° to flow along the laser head 42. Ostler accordingly fails to disclose or suggest a cooling fan at one end of the power source that generates an airflow directed in a generally straight line path with the laser source and the power source. Because Ostler fails to disclose or suggest all the claimed features, the Section 102 rejection of claim 15 should be withdrawn.

Claim 15 is further patentable over Ostler under Section 103 because there is no suggestion or motivation to modify Ostler come up with the claimed combination of features. As discussed above with respect to claims 1 and 7, such modifications are not suitable in light of the teachings of Ostler.

Claims 16-19, 21, and 22 are patentable under Sections 102 and 103 over Ostler as depending from patentable base claim 15, and also because of the additional features of these dependent claims.

B. Response to Section 103 Rejection of Claims 4, 12, and 20 (Ostler and Sukhman)

Claims 4, 12, and 20 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Ostler in view Sukhman. Claims 4, 12, and 20 depend from allowable base claims 1, 7, and 15, respectively. As discussed above, Ostler fails to disclose or suggest all the features of claims 1, 7, and 15. Sukhman is relied on in the Office Action for disclosing cooling fins profiled in a direction along the longitudinal axis of the laser. Sukhman, however, fails to cure the above-noted deficiencies of Ostler, and therefore fails to support a Section 103 rejection of claims 1, 7, and 15. For example, Sukhman discloses a fan that is offset from the longitudinal axis of the laser and is configured to initially direct the airflow generally normal to the longitudinal axis of the laser. Accordingly, dependent claims 4, 12, and 20 are allowable over the combination of Ostler and Sukhman for at least the reason that these references, either alone or in combination, fail to disclose or suggest the features of claims 1, 7, and 15, and the additional features of claims 4, 12, and 20. Therefore, the Section 103 rejection of claims 4, 12, and 20 should be withdrawn.

C. New Claim 23

New claim 23 has been added to the present application. The subject matter of this claim is supported by the figures and the text of the original application. Therefore, this claim does not add any new matter to the application, and is fully supported under Section 112, paragraph one. New claim 23 is patentable over Ostler and Sukhman for at least the reasons discussed above, and also for the additional features of this claim.

Conclusion

In view of the foregoing, the pending claims comply with 35 U.S.C. § 112 and are patentable over the cited art. The applicants accordingly request reconsideration of the application and a mailing of a Notice of Allowance. If the Examiner has any questions or believes a teleconference would expedite prosecution of the application, the Examiner is encouraged to contact the undersigned representative at (206) 359-3982.

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Respectfully submitted,

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